

## NEC Class 2 Power Supplies - What Is The Difference Between Standard Supplies

The National Electrical Code (NEC) is the North American guideline for all electrical installations. NEC Article 725 is titled Class 1, Class 2, and Class 3 Remote-Control, Signaling and Power-Limited Circuits. This issue of "The PULS Advantage" will primarily focus on power limited Class 2 circuits and power sources. It is important to understand that NEC Class 2 is not to be confused with Class 1 Division 2 - Electrical Equipment for Hazardous Locations.

### Class 2 Circuit:

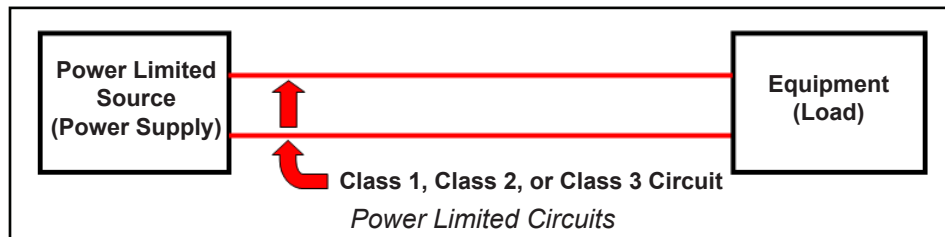
A Class 2 circuit is the portion of the wiring system between the load side of a Class 2 power source and the connected equipment. Due to its power limitations, a Class 2 circuit considers safety from a fire initiation standpoint and provides acceptable protection from electric shock.

everyone can understand is the doorbell at your home. The doorbell transformer (Class 2 Source) has the input wiring inside an approved UL enclosure, but the output terminals are exposed where an individual can reach up and touch. Even if a person was touching the terminals, the power source will not deliver enough energy to cause an electric shock under any circumstances. The doorbell wires are routed along joist and studs and at some point they enter the wall on the way up to the chimes where they can make physical contact with "Kraft" back insulation. If a nail or a screw is accidentally driven through the wires and creates a short, the doorbell transformer will not deliver enough energy to cause the wires to heat up where it catches the paper-lined insulation on fire. Although this is an example of an AC Class 2 application, the same principle applies

spread of fire. Two or more Class 2 circuits are allowed in the same enclosure or raceway. However, Class 2 wiring must be separated from power and lighting and Class 1 circuit conductors. Circuits that do not meet Class 2 or Class 3 are often classified as a Class 1 Circuit.

### Class 2 Power Source

Chapter 9, Table 11B, defines the power limitations of a Class 2 source. If a 24VDC power supply (the most commonly used Class 2 voltage) is chosen for an application, then the maximum power allowed is 100W. After a small start up window, the 100W can not be exceeded under any circumstances including overload, short circuit or internal failure of the supply. If a power supply is used as the Class 2 power source, then the power supply must be a Listed Class 2 power supply (UL 508) and the power supply must be clearly marked as a Class 2 Power Source. The NEC Article 725 is the guideline for Class 2, but UL 1310 is the test standard for Class 2 units. This standard covers direct plug-in and cord-connected Class 2 units. UL 1310 sets power levels according to the NEC. Many industrial grade DIN-rail mount power supplies may be tested to the UL 1310 standard; however, these power supplies are not covered by the standard. One advantage of using a Class 2 power supply is that if you have any devices that are not UL Approved and these devices are connected to a Class 2 source, UL typically does not require additional testing. There are countless applications where Class 2 power supplies are required; closed circuit TV systems, access door controls, alarm systems, LED signs, light controls and sensors just to name a few. PULS has one of the largest selections of NEC Class 2 supplies. No matter what the output voltage or your application, PULS can provide a supply that meets your requirements. Check out our catalog or visit our web site to find out more about our Class 2 supplies.



For reference, a Class 3 circuit is similar to a Class 2 circuit but is connected to a Class 3 source and considers safety from a fire initiation standpoint only. Additional protection is required to prevent electric shock. A Class 1 circuit is connected to a power limited source but offers no protection from fire or electric shock. A Class 2 circuit offers the highest degree of protection. A Class 2 circuit is limited either "Inherently", where no overcurrent protection is required, or "Non-Inherently", where overcurrent protection is required. The maximum circuit voltage for a Class 2 Inherently Limited Power Source is 150V and 60V for a Non-Inherently Limited Power Source. A Class 2 circuit can be either AC or DC. All PULS Class 2 Supplies are inherently protected. A good example of a Class 2 circuit that

when using a PULS NEC Class 2 power supply. Class 2 circuits are intended for indoor dry locations.

### Class 2 Wiring Methods

A Class 2 circuit is characterized by its usage and power limitations and differs from light and power circuits which are covered by chapters 1 through 4 of the National Electrical Code. The differences deal with wire size, de-rating factors, overcurrent protection, insulation requirements, wiring methods and materials. In a Class 2 application, wiring can be exposed and does not need to be routed through conduit or other raceways. Typically, smaller wires can be used. However, special rated wires are required when installed in specific locations which are flame resistant and help prevent the